

US009510508B2

US 9,510,508 B2

Dec. 6, 2016

(12) United States Patent Jung

(54) MONITORING SYSTEM FOR CONTROLLING THE POSITION OF AN IMPLEMENT FOR AN AGRICULTURAL VEHICLE WHILE TAKING THE VEHICLE DYNAMICS INTO ACCOUNT

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 14/686,977

(22) Filed: Apr. 15, 2015

(65) Prior Publication Data

US 2015/0305239 A1 Oct. 29, 2015

(30) Foreign Application Priority Data

Apr. 29, 2014 (DE) 10 2014 208 070

(51) **Int. Cl.**A01D 41/127 (2006.01)

A01D 41/14 (2006.01)

A01D 75/00 (2006.01)

(45) Date of Patent:

(10) Patent No.:

(56)

References Cited

2004/0006958	A1*	1/2004	Thiemann A01D 41/141
2008/0177449	A1*	7/2008	56/10.2 R Pickett A01D 41/141
			701/50
2011/0099962	Al*	5/2011	Coers A01D 41/141 56/10.4
2013/0091819	A1*	4/2013	Deneault A01D 41/141
2015/0230403	A1*	8/2015	56/10.2 E Jung A01D 41/127
2015/0250105	711	0/2015	701/50

U.S. PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS

DE 19900212 A1 8/2000 DE 20007795 U1 10/2001 (Continued)

OTHER PUBLICATIONS

European Search Report issued in counterpart application No. 15160060.8, dated Sep. 23, 2015 (6 pages).

Primary Examiner — Dale Moyer

(57) ABSTRACT

A control unit is connected to an actuator to adjust the position of the implement relative to the vehicle. A ground-profile determining device is connected to the control unit and is designed to determine a ground profile in front of the vehicle. The control unit is programmed to determine an expected vertical movement of the vehicle because of the ground profile and to prospectively transmit to the actuator a control signal that is dimensioned such that the implement is continuously guided in a predeterminable position above the ground profile. The control device considers the expected deformation of the ground profile because of the tires or tracks of the vehicle or an expected vertical movement of the vehicle relative to the ground profile.

15 Claims, 3 Drawing Sheets

